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(12) **United States Patent**  
**Trocki et al.**

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(54) **FRONT-LOADING MEDICAL INJECTOR  
ADAPTED TO RELEASABLY ENGAGE A  
SYRINGE REGARDLESS OF THE  
ORIENTATION OF THE SYRINGE WITH  
RESPECT TO THE INJECTOR**

(58) **Field of Classification Search**

CPC ..... A61M 5/14546; A61M 5/14566; A61M  
5/007; A61M 2205/6072

(Continued)

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(56)

**References Cited**

U.S. PATENT DOCUMENTS

1,988,480 A 1/1935 Campkin  
2,702,547 A 2/1955 Glass

(Continued)

FOREIGN PATENT DOCUMENTS

DE 2919978 A1 11/1980  
DE 3227417 A1 2/1982

(Continued)

OTHER PUBLICATIONS

Liebel-Flarsheim Company, Angiomat 6000 Digital Injection Sys-  
tem Operator's Manual, 600950 Rev. 1, pp. 3-6 to 3-8, 4-52 to 4-56  
(1990).

(Continued)

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(65) **Prior Publication Data**

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**A61M 37/00** (2006.01)

**A61M 5/145** (2006.01)

(52) **U.S. Cl.**

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(2013.01); **A61M 2205/60** (2013.01);

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(57)

**ABSTRACT**

A syringe for use with an injector includes a body having a  
rear end and a front end, a plunger movably disposed within  
the body, an attachment member associated with the body  
and adapted to releasably engage a syringe retaining mecha-  
nism of the injector regardless of the orientation of the  
syringe with respect to the injector, and an encoding device  
operable to provide syringe information to the injector.

**16 Claims, 137 Drawing Sheets**

